

CLAIMS

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1 Heat transfer fluid, for use over a broad range of temperatures, consisting essentially of a component selected from the group consisting of:

10 (a) a mixture of at least two structurally non-identical cycloalkane-alkyl or -polyalkyl components, wherein the cycloalkane moiety contains from 5 to 8 carbon atoms, the alkyl moiety contains from 1 to 6 carbon atoms with the proviso that the total number of carbon atoms in the alkyl moiety(ies) is in
15 the range of from 1 to 10;

(b) a mixture of, at least, two structurally non-identical aliphatic hydrocarbons having a linear or branched chain with from 5 to 15 carbon atoms; and

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(c) a mixture of a cycloalkane-alkyl or -polyalkyl, wherein the cycloalkane moiety contains from 5 to 8 carbon atoms, the alkyl moiety contains from 1 to 6 carbon atoms with the proviso that the total number of carbon atoms in the alkyl moiety(ies) is in
25 the range of from 1 to 10, and an aliphatic hydrocarbon having a linear or branched chain with from 5 to 15 carbon atoms;

at a level such that the composition has: a cloud point below -100 °C, preferably in the range of from -110 °C to -175 °C; a
30 vapor pressure, at +175 °C, below 1300 kPa and a viscosity, measured at the cloud point temperature +10 °C, below 400 cP.

2. The heat transfer fluid in accordance with Claim 1 wherein the alkyl moiety in the cycloalkane-alkyl or -polyalkyl
35 component is selected from methyl, ethyl and propyl and mixtures thereof.

3. The heat transfer fluid in accordance with Claim 1 wherein the aliphatic hydrocarbon contains from 5 to 10 carbon atoms.

4 The composition in accordance with claim 1 wherein the
5 viscosity is below 300 cP.

5. The composition in accordance with Claim 1 wherein the vapor pressure, at +175 °C, is below 827 kPa.

10 6. The heat transfer fluid in accordance with Claim 1 wherein the cycloalkane-alkyl component is represented by: cyclohexane-methyl, -dimethyl, -ethylmethyl, -trimethyl, -ethyl and -propyl; cyclopentane-methyl, -dimethyl, -ethylmethyl, -trimethyl, -ethyl and -propyl; cycloheptane-methyl, -dimethyl, -ethylmethyl, -
15 trimethyl, -ethyl and -propyl; and cyclooctane-methyl, -dimethyl, -ethylmethyl, -trimethyl, -ethyl and -propyl.

7. The heat transfer fluid in accordance with Claim 1 wherein
20 the aliphatic alkane is represented by: pentane-2,2,4-trimethyl; pentane-2,3,4-trimethyl; pentane-2-methyl, pentane-3-methyl; hexane-2-methyl; hexane-3-methyl; n-hexane; hexane-2,2-dimethyl; hexane-3,3-dimethyl; n-heptane; heptane-4-methyl; n-octane; and octane-2-methyl.

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8. The heat transfer fluid in accordance with Claim 1(a) wherein the ponderal ratio of the structural non-identical cycloalkane components is in the range of from 95 : 5 to 5 : 95.

30 9. The heat transfer fluid in accordance with Claim 8 wherein the cycloalkane components are represented by combinations of: ethylcyclopentane/ethylcyclohexane; ethylcyclopentane/n-propylcyclohexane; methylcyclohexane/ethylcyclohexane;
35 methylcyclohexane/n-propylcyclohexane; ethylcyclohexane/n-propylcyclohexane; and methylcyclohexane/ethylcyclopentane.

10. The heat transfer fluid in accordance with Claim 1(c)
wherein the ponderal ratio of the cycloalkane component to the
aliphatic hydrocarbon is in the range of from 97 : 3 to 10 : 90.
- 5 11. The heat transfer fluid in accordance with Claim 8 wherein
the ponderal ratio of the cycloalkane components is in the range
of from 75 : 25 to 25 : 75.
- 10 12. The heat transfer fluid in accordance with Claim 10
wherein the ponderal ratio of the cycloalkane component to the
aliphatic hydrocarbon is in the range of from 80 : 20 to 25 :
75.
- 15 13. The heat transfer fluid in accordance with Claim 12
wherein the ponderal ratio of the cycloalkane component to the
aliphatic hydrocarbon is in the range of from 70 : 30 to 35 :
65.
- 20 14. The heat transfer fluid in accordance with Claim 1(c)
wherein the weight ratio of the aliphatic hydrocarbon to the
cycloalkane component is in the range of from 90 : 10 to 60 :
40, whereby the aliphatic hydrocarbon is selected from 2-
methylpentane, 3-methylpentane, 2,2,4-trimethylpentane and n-
25 hexane and the cycloalkane component is selected from ethyl-
cyclohexane and methyl-cyclohexane.